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Special Report

RETHINKING LEAN: BEYOND THE SHOP FLOOR





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Once the domain of manufacturing, lean has migrated far beyond the shop floor, transforming service organizations and innovation efforts. The principles of waste elimination, worker involvement and continuous improvement haven't changed, though, and the results are still impressive. In this special report, experts from Wharton and The Boston Consulting Group look at how lean is transforming health care, R&D and finance.

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Toyota's legendary lean production system emerged after World War II and transformed the auto industry. Since then, lean principles have moved into every area of an organization and every industry. One Wharton professor remembers trying to talk with hospitals about lean initiatives several years ago. "They thought I was evil. They said, 'We're doctors. We help people. We are not Toyota!' Now these same institutions have chief medical officers saying, 'We want to run this place like Toyota!'"

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Does the lean structure and discipline snuff out the creative spark that underlies the birth and development of great ideas? In fact, lean brings structure and predictability to innovation, and sharpens the distinction between idea generation and the development process. If a company as innovation-driven as Pixar can apply lean principles to innovation, then others can, too.



The Lean Evolution: From Factory Floor to Service Centers — and Beyond

In 2008, the University of North Carolina Health Care System faced a challenge: Length of stay per patient at this major nonprofit health system and academic medical center was longer than it needed it to be. If administrators could figure out how to cut the length of stay by an average of just 10% — without compromising patient health — the system could add tens of millions of dollars to its operating budget and, most important, provide care to more patients.

Reducing UNC Health Care's length of stay without affecting quality required analyzing every aspect of patient care, identifying inconsistencies and redundancies, and finding ways to improve the service, according to Jon Scholl, a partner and managing director at The Boston Consulting Group (BCG). One step involved setting goals for shorter stays and putting a whiteboard in every room. "The nurse writes daily goals on the board," says Scholl, who helped guide the health system through its successful initiative. "This involves patients in their own care. Now they have a sense of what needs to happen before they'll be discharged, and what progress they've made." It gives them goals to shoot for — and most times they achieve them.

Additional steps involved daily care-plan meetings and improved communications based on centralized, accessible data. "One Friday, the Orthopedics care coordinator had a meeting about a patient," says Scholl. She and the nurse noticed that everything on the care plan was completed and the patient was in good health, except for one last thing: a final visit to physical therapy (PT). "So the nurse took the initiative to contact PT, which changed its schedule to accommodate the need. This freed up a bed on a Friday instead of a Monday" and shortened the patient's length of stay.

No one had to work more hours. No new hires were needed. In other words, UNC Health Care did more with less — the classic definition of "lean." But wait: Where is the assembly line? Where are the widgets? And where are the across-the-board layoffs? Today, lean initiatives are popping up in health care as well as in research and development (R&D) and other functional areas previously outside of lean's purview. These initiatives are a far cry from reductions in force, rote factory protocols and other cost-cutting tactics traditionally associated with lean.

In this article, part of a special report on how lean processes can transform businesses beyond the shop floor, experts from Wharton and BCG explain how thinking lean can drive significantly better results from service organizations, corporate functions, even from innovation efforts.

Patients have a sense of what needs to happen before they'll be discharged, and what progress they've made. It gives them goals to shoot for — and most times they achieve them.

Begin with Questions, Not Rules

Christian Terwiesch, a Wharton professor of operations and information management, remembers trying to talk with hospitals about lean initiatives several years ago. "They thought I was

evil,” he recalls. “They said, ‘We’re doctors. We help people. We are not Toyota!’ Now these same institutions have chief medical officers saying, ‘We want to run this place like Toyota!’”

“The old world of lean was primarily about optimizing what you were doing on the shop floor,” says Aryn Merchant, a senior partner and managing director at BCG. “It was about figuring out how to move an item from Location A to Location B.” Today, he says, “Lean is not just widget management. It’s about process management and information-flow management.”

According to Hal Sirkin, a BCG senior partner in Chicago and global leader of the firm’s operations practice, companies should always begin their lean efforts by asking: What are we trying to achieve? “It doesn’t begin with a rule. And it’s not about isolating one piece of a business and deciding its fate. It’s about rethinking every business process.” It’s not about cost cutting across the board, he says. It’s about judicious investing. It’s not about starving. It’s about building muscle, trimming fat.

Sirkin notes that an increasing number of lean initiatives are happening outside the factory — in call centers, for example. The process, he says, starts with questions. “Do you understand your customer segments? Can you serve the most valued customers more effectively? How are calls routed and how long does it take for reps to resolve an inquiry? Where do they go for information? Three screens? Scrolling? Is there an easier way?”

Wharton operations and information management professor Serguei Netessine says the evolution of lean involves two key things: “One is better tools, and the other is a greater sense of urgency in an economic crisis.” Lean springs directly from the Toyota Production System (TPS), says Netessine. “It was created in very similar times, after the Second World War, when Japan was in crisis. In those years Toyota had to innovate, to create value from nothing. They didn’t have much money or many resources. They were forced to create lean.”

Tapping Collective Intelligence

Years later, lean is spreading from its nuts-and-bolts origins and is moving throughout the organization — even over to R&D, to knowledge workers. What’s new about lean in the R&D wing of the organization? Adam Farber, a BCG partner and managing director, says it’s about having a cross-functional thought process; viewing the business

as a system and understanding how things need to be connected, from activities, to metrics, to incentives. “We’ve seen this starting to play out in the pharmaceutical industry,” he says. “It is quite ambitious.”

Today, explains Farber, “we use the term ‘tapping the collective intelligence of the organization.’ Instead of having someone come in, not think, just transact, we ask, ‘How do we allow them to be a business owner, to improve the process, to tell their supervisor what can make the job better?’” And when this happens, he says, employees adopt a new attitude about coming in to work. They feel as though they count. “The collective intelligence of the organization is being tapped,” says Farber. “This has to be done systematically.”

It’s about Overhead, Not Labor

When people think about lean, they often associate it with reducing the workforce, Farber says. But the cost is not in the line labor, it’s in the overhead, he says. The most important thing is the seamless integration of everything that goes into the production, Farber adds. “Take a pharmaceutical company with a quality control and assurance organization whose goals are not 100% aligned with production goals. There may be something broken between management and support functions.” If so, it’s time to ask whether you understand the business requirements and whether functional groups are aligned around product flow, Farber says. Find out if the metrics are in place. “When there is a fundamental shift and the system no longer works, revisiting the system top down and engaging colleagues bottom up has to be the focus.”

A key part of this involves looking at the business differently, says Farber. “It’s not about hiring a star. It’s about system-wide efforts — production, quality, engineering, maintenance, everyone showing up on time. And you need metrics.” At a hospital, you need metrics on moving patients from the operating room back to bed, for example. That requires getting nurses, techs, and other hospital employees into a collective dialogue around ensuring efficiency.

Service organizations can look to manufacturing for lessons on lean. Lean production tries to smooth demand, notes Noah Gans, a Wharton professor of operations and information management. A good example from the manufacturing world is the Christmas toy season. “You don’t open your factory the month before Christmas,” he says. It’s best to

build inventory slowly months out. Then it starts to pay to carry some inventory. But if production is not synchronized, “You may get stuck with lots of inventory.” In manufacturing, Gans says, customers don’t see how the thing gets made. They probably don’t care. But in service businesses, “Customers see the process. In many cases, it’s personal. So if your service doesn’t track customer dissatisfaction you might never know about your product.” Many service organizations would like to have the same economic quality-control discipline as manufacturers, Gans says. One way to do it: Offer service guarantees. “This is a lean notion transferred to services.”

BCG’s Merchant recalls an initiative at a consumer goods company to improve efficiency in Indonesia. The company needed to transport bottles of liquid hair dye from two major centers to a range of islands by boat, car, truck, plane and rail. “The bottles created a shipping nightmare,” he says. During the long, rough route from the distribution centers to the outlying areas, the liquid often leaked. According to Merchant, “Trucking the goods to the urban centers was easy, but that accounted for only 25% of the products.” The lean process involved segmenting the entire approach. The key question: How can you get the product to outlying areas with less shrinkage? The answer: Ship the product in a powdered form. “You just add water later. Now you’re shipping powder more efficiently in little sashes that don’t spill.” That is a leaner distribution.

Yet, like many philosophies in life, lean is more easily studied than practiced. It’s easy to observe but hard to replicate, says Wharton’s Netessine. “Toyota has always been open about lean. They invite people to tour the factory and see for themselves. Companies try to re-create it. It seems relatively easy on the surface, but it’s hard.” People see the results, he says. But they don’t always appreciate that the results came from comprehensive analyses, deep questioning, and out-of-the-box thinking.

Wharton’s Terwiesch says lean initiatives begin with identifying and standardizing a process. “Try to think of your business as repetitive,” he says. “You’re not a robot, but even heart surgery is repetitive. A lot of what we do is repetitive, but we don’t think about that.” After you think about your processes, says Terwiesch, set some milestones. “It could be how long someone stays in the (intensive care unit), or it could be a manufacturing process.”

Next, measure performance. Many companies struggle to align lead times, inventory and other

data to financial measures, even with performance metrics in place. This problem arises when companies don’t measure the right things — usually because they haven’t thought deeply enough about their own processes. Instead of coming to a better understanding, he says, “They die a death of a thousand metrics.” Finance people may not recognize the meaning of it when machines aren’t calibrated or processes aren’t aligned. “They don’t realize that machines are down for long periods mid-shift. At big companies there are so many sub-units or plants, you don’t typically get into that level of detail,” he says. Senior management tells middle management to get metrics, but no one is looking at the big picture. They’re not thinking about the underlying processes. But that level of thinking is exactly what’s required to go lean. “You have to rely on the folks who are involved in the trenches,” Terwiesch says. “You have to change the identity of the worker from human robot to problem-solving partner.”

Toward a Lean Transformation

Wharton management professor Lawrence G. Hrebiniak has seen cases where one business acquires another but misses the opportunity to create a lean version of the new organization. “They could be buying a business that would open a new door to them, a tech division, for example. But as soon as they acquire the new business they make cuts across the board. They’re trying to be fair. Instead, they should be rational.” Most important, he says, is communication. Companies need to know how to share knowledge across the silos. But people don’t always understand the matrix. For example, consider a firm in global competition. There may be a low level of interdependence. There may be many global divisions. Maybe they are all profitable, but with very little sharing among them. But “you still need a coordinated global strategy. Say you’re doing something in the U.K. and doing something in Italy. You may need to manage the movement of products across countries. That’s complex knowledge sharing.”

Organizations considering a lean transformation would be wise to consider the following:

Start with a pilot program. BCG’s Farber describes working with a company that ranked last in quality and last in cost performance, and wanted to improve both. The company had a network of about 10 plants. The owners wanted to improve the entire network’s performance. They knew that some of the business unit leaders would buy in, and some

wouldn't, says Farber. "Some were ready for a programmatic effort, some not. So the answer was to go to one plant, do the work there, make it a star performer, and then apply it to the other plants." Often, he says, this pilot approach evolves naturally. "One site leader or functional group takes it on, and there's a dramatic improvement. People say, 'Wow what did you do?' Then it can be replicated." Farber warns that the initiative can go wrong when the fix is determined by the experts and then rolled out to the whole system. This ignores people and their potential for contribution and engagement.

Focus on continuous improvement. This is a way of life, a continuous process that never stops, says Netessine. "TPS wasn't implemented just once. It's constant improvement, constant innovation and constant elimination of extra steps. The most important principle is that this is not a four-month project. You will see benefits, but you must do it continually."

Change how you work and how you think. Stop treating your workers as people who do as they are told. Your line workers should be innovators. Remember, they face problems every day. In most organizations, their problems are ignored or worked around. "At lean companies, management listens to workers' recommendations," Netessine says. "They take workers' comments seriously. That's a big change."

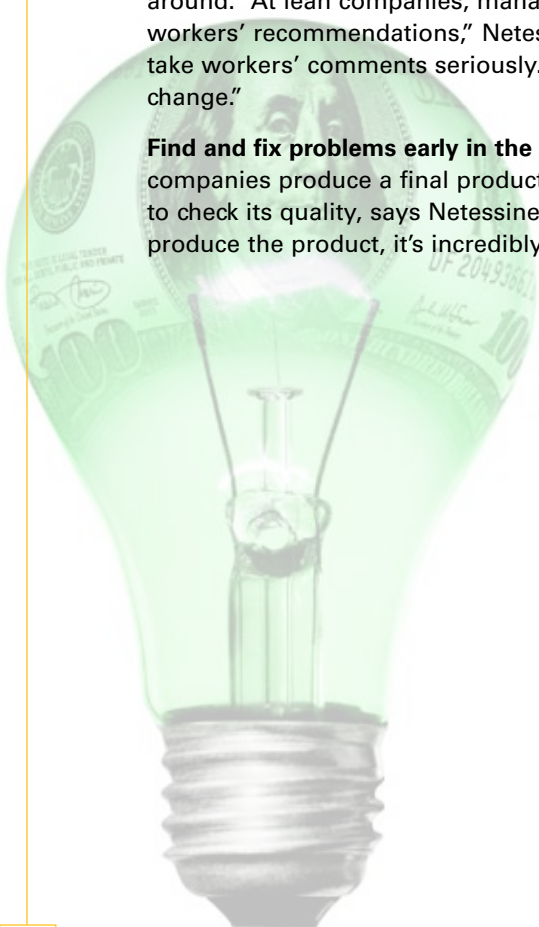
Find and fix problems early in the process. Most companies produce a final product and then try to check its quality, says Netessine. "But once you produce the product, it's incredibly expensive to fix

quality problems. It takes GM as long to fix a quality problem as it takes Toyota to produce a car from scratch. You have to raise a red flag right there." And when you do, he says, people will try to stop you; they'll tell you it's crunch time. They promise to deal with it later. "At Toyota, one person on the line can pull a cord and stop production," says Netessine. "They don't even have to pull it very often because when people see a problem it gets dealt with."

Involve frontline employees in problem solving. Get them thinking and talking. And start listening to them. Ask them about root problems, and then solve those root problems, says Netessine. "A lot of times, companies solve symptoms but not actual problems. At Toyota, workers ask four 'whys' about each problem. Why does this happen?" Once they get the answer, they ask, "Ok, so then why does *that* happen? They keep asking, following the symptoms back through the layers until they arrive at the root cause. This kind of questioning drives organizations to continuously solve root problems.

Appoint a CPO (chief process officer). Select someone who can see the big picture, think out of the box, ask the difficult questions, help rethink business processes, analyze each customer segment, and keep the organization focused on the right questions.

For years, many professionals and most knowledge workers thought that lean applied to blue-collar workers, not to them. "But now we've seen these lean tools, and this lean mentality applies to all jobs," says Terwiesch. "It's good management." ●





Lean Health Care: Lower Costs, Better Outcomes

Toyota's legendary lean processes

didn't come out of nowhere. They were forged by the fire of urgency in post-World War II Japan when resources were scarce. Toyota innovated – and continued to innovate. Today, the Toyota Production System is the most respected manufacturing and inventory control system on earth — and very hard to duplicate. The company has been able to consistently reduce waste and cost through its commitment to lean and high quality products.

Could lean processes transform the U.S. health care system, with its spiraling costs and inconsistent quality?

Health care, of course, is different from manufacturing. There are no shop floors, products or assembly lines *per se*. But the industry's growing problems — not to mention the challenges of health care reform — are creating a sense of urgency and a strong mandate for change. Can lean techniques help hospitals increase efficiency, streamline processes, and improve patient outcomes and patient satisfaction? In this article, part of a special report on how lean processes can transform businesses beyond the shop floor, experts from Wharton and The Boston Consulting Group (BCG) explain how it is possible to accomplish these goals.

Length of patient stay is a critical measure of effectiveness and efficiency. A shorter stay means that beds turn over more quickly and hospitals can treat more patients without investing additional capital. According to Jon Scholl, a partner and managing director at BCG, a hospital with 800 beds that cuts average length of stay by just 10% can free up nearly 80 beds per year, enabling the delivery of more than 4,000 additional procedures and boosting operating profit by almost \$30 million.

This approach effectively “builds” new beds for the hospital. With new construction costs averaging \$1 million per bed today, “another \$80 million in averted capital can be realized,” says Scholl. “If you can lower length of stay by 10%, just look at the incredible leverage a hospital has.”

So how can a health care system run with this?

A hospital with 800 beds that cuts average length of stay by just 10% can free up nearly 80 beds per year, enabling the delivery of more than 4,000 additional procedures and boosting operating profit by almost \$30 million.

The Longer the Wait, the Longer the Stay

“Executives can't rescue the length of stay,” says Lawton Robert Burns, director of the Wharton Center for Health Management and Economics. “Clinicians do that. Doctors do that by being more efficient, getting discharge orders done quickly, allowing discharge planners to do their job.”

But physicians are generally a drag on length of stay. If the attending physician is a community-based doctor, his or her main practice is outside of the hospital. For discharge, that doctor has to get back to the hospital. “You can imagine all the communication gaps between the nurse manager

and that doctor. Patients sit around waiting for treatments and for discharge. They may need diagnostic tests, an X-ray, and physical therapy — all those hand-offs.” If any one of those doesn’t happen on time, it can delay discharge. The longer patients wait, says Burns, the longer their hospital stay — and the greater the chance of infection.

With help from BCG, the University of North Carolina Health Care System (UNC Health Care) launched a lean pilot program that is increasing efficiency and enabling the hospital to serve more patients. UNC Health Care is an 800-bed hospital and medical school. Its problem, according to Scholl, was that its capacity was stretched to the limit in most areas of the hospital. As an important local public hospital and trauma center, UNC Health Care needed more space. But adding a new bed costs a million dollars and takes several years.

Glen Spivak, UNC Health Care’s vice president of operational efficiency, explains the reason for going lean: “At the end of the day, we’re not doing this to reduce length of stay for its own sake. We’re doing it to provide better care, to use our resources more efficiently. There are opportunities to be more efficient.”

Adam Farber, a partner and managing director at BCG, agrees. “You need to be clear on what you are trying to achieve with lean,” he says. “You can’t set a goal of wanting to do lean. Lean is not an outcome. Performance is an outcome. Competitive advantage is an outcome.”

UNC Health Care’s desired outcome was clear: Reduce length of stay without affecting quality of care.

A Whiteboard in Every Room

“None of this is rocket science,” says Douglas R. Dirschl, MD, professor and chairman of the department of orthopedics at UNC Health Care. “It’s pretty intuitive.” But a key problem is that physicians and hospitals typically are not on the same page. “It’s a gross generalization,” says Dirschl, “but the incentives for hospitals and physicians in U.S. health care have been historically different.” Lean processes can help close that gap.

Dirschl provided an example of what the initiative looks like in action: “Take someone who is having a total hip replacement. The patient is scheduled to come in to the hospital on a certain day, and they will need certain things accomplished in order to

leave the hospital.” By planning better in advance, knowing what the patient will need, says Dirschl, “we can accelerate the process a little bit. Even prior to admission we begin to communicate with the patient about what their home health needs will be, what equipment they’ll need at home. We begin those conversations before admission.” Once admitted, Dirschl says the staff explains what is expected of them day by day while they are in the hospital. “The goal is to discharge these patients on the morning of the third post-op day,” says Dirschl. “That is one day sooner than it was typically in the last five years.”

UNC Health Care’s lean initiative included a written care plan and a whiteboard in every room with daily goals to help keep the patient focused on his or her discharge date. The pilot program lasted about two months. It kicked off in the orthopedics, medical oncology, pulmonary and infectious disease areas. “We measured important changes,” says Dirschl. “In orthopedics we decreased length of stay by one day, which meant we were freeing up three to four hospital beds each day.” Plus, patient satisfaction scores went up by 10% over historic averages. “From day one, there was a focus on communication. Patients were told, ‘Here is your target discharge date. Here is what has to happen for you to get out of the hospital.’” Communication had been less consistent in the past. “We needed a better vehicle.”

If the pilot program results were applied to the entire hospital, it would effectively raise capacity by about 80 beds and add \$35 million to the bottom line. “Expanding bed capacity directly improves net income,” says Dirschl. It’s like having more beds without adding to fixed costs.” The pilot approach is now standard procedure in the three test areas, and UNC Health Care plans to launch lean initiatives hospital-wide.

According to Scholl, creating a fast, easy-to-use plan of care was the essence of BCG’s work. Within the first 24 hours following admission, the doctor now checks off the care and education a patient will need. With that care plan in place, “the care manager and nurse know exactly what to do.”

Another part of the lean initiative was a top-down review of day-to-day administrative procedures, Scholl says. “We began to identify common problems, bottlenecks in other areas.” Then the hospital looked into it. For example, sometimes it

would take a couple days for the central intravenous line to be inserted [into a patient]. “This is often because people don’t always communicate well,” Scholl says. Such problems could easily delay discharge, but once they were identified, planners could provide logistical solutions to systematically reduce the length of stay.

Spivak explains that before the initiative, UNC Health Care knew there were ways to speed up release, but rarely took action. For example, one patient was supposed to leave the hospital at a given time. But because no one gave the family proper notice, no family member was available at the time of discharge to drive the patient home, or to provide home care. In many other cases a patient may need, say, one final test before discharge, but staff members don’t expedite its scheduling because they are unaware that it’s the only thing holding up the patient’s release. Once they find out, it often causes a flurry of activity. Too often, however, the flurry comes too late and the patient must stay in the hospital an extra day.

The keys to success, according to Spivak: “Good expectation management, planning and communication. These are the basics of Project Management 101.”

Wrong Side of the Equation

If the solution is so simple, why did it take so long? According to Chris P. Lee, a professor of operations and information management at Wharton, “One reason for opposition is ethical concerns.” At first blush, he says, many physicians think that lean is all about production. But they’re wrong. “The Toyota Production System is not about a particular type of product, but basic principles.”

Another reason some medical professionals are cool to lean, according to Lee, is that people often focus on the wrong side of the equation. In production there’s a concept of thinking about things from the point of view of resources or products rather than consumers. “If I ran a hospital that believed that its mission was to care for patients, the number one thing I would do is start seeing things from the patient’s point of view.” He’d follow individual patients throughout their entire stay at the hospital. “Then I’d ask how much time they spent waiting and how much time they spent having care performed. You’ll see the majority of time is spent waiting. I think every care professional should begin to see it from the patient’s perspective.”

Lee says this should be traced back to the beginning, to appointment-taking. The average time to get an appointment is about three weeks. “It’s not just that patients wait once they are in the hospital. They begin waiting after they hang up the phone after making an appointment.” Why the delay? Lee believes it’s because hospitals book appointments weeks in advance. That leads to a lot of “no-shows.” The solution might come down to “open access” — that is, making appointments only for the next day. Lee explains, “The backlog is a function of having fallen behind matching the supply of care to the demand of care.” And the backlog grows if they continue to make appointments they can’t handle. Also, the longer the wait, the more chance the patient won’t show up for the appointment, so it becomes a vicious circle. “These clinics and hospitals with backlogs have a lot of no-shows and a lot of idle time every day,” notes Lee.

Lee also believes there is room for improvement in patient handoffs. “Look at how many times patients are handed off during their hospital stay. There are numerous handoffs to doctors, nurses and various departments.” When hospitals adopt lean methods, he says, they tend to stop passing patients between care professionals. Instead, they develop care teams of dedicated professionals who handle patients. “This reduces handoffs, it reduces medical errors, it reduces length of stay, and it improves patient satisfaction greatly.” More handoffs lead to more medical errors. And more medical errors lead to longer lengths of stay.

Overcoming Resistance

Maria Rieders, an adjunct professor of operations and information management at Wharton, has observed various lean health-care initiatives. Over the last few years, she says, hospitals have systematically decreased the number of infections by standardizing their procedures. But standardization can go a lot further in the health-care environment.

“The underlying goal is to get the best product to the customer in the best possible way,” she says. “In this case, the customer is the patient.” While noting that lean health care is not brain surgery, she understands the resistance. The problem is that health-care professionals are so dedicated and professional. “They are well-educated and by nature focused on doing the best at all times. If they encounter a problem they quickly try to come up with a solution.” But they are not systems thinkers.

In industrial engineering, “you try to look at the processes working in that system as part of your system set.” The physician, on the other hand, is trained as a problem solver. “He does not follow the patient from the very beginning when they are admitted to discharge.” If you start thinking in terms of systems you would arrive at a different viewpoint. “You begin to see that in collaboration with others it does make sense to come up with standardized rules.”

Another obstacle to successful lean health care, Rieders says, is that medical professionals are incredibly busy. “If you visit a hospital floor, you see that nurses don’t sit around and gossip,” she says. They don’t have time to discuss how to improve things. If you want to improve things you have to invest a little, and who has the time? Imagine you are trying to look at an infectious disease ward and review its practices with an eye toward standardization. “Everyone is willing to get together but there is no extra time. There has to be a commitment on a fairly high level so that these efforts are not idle management efforts, but are being put into place to improve patient care. With that commitment comes the ability to free up some nurses to attend workshops.”

What strikes Rieders about hospital settings is that “you really work with great people.” Toyota has cultivated a culture of continuous improvement where every worker is part of the solution. Workers are encouraged to stop the assembly line if they see a problem. They are not encouraged to cover up, but to get to the root cause of the problem. In a hospital you have an educated, dedicated workforce. “When you explain to them how much they can contribute to the solution, you don’t have to work hard to convince them to come on board. A lot of these dedicated people are already problem-solvers. They just need to take a look at and think about the entire system.”

But, Rieders adds, if you don’t have a top-level manager who is a strong advocate of the program, “you might wind up with a temporary, short-term improvement, and the system is likely to slide back to status quo.”

According to BCG’s Merchant, the reason no one can copy the Toyota Production System is “the mindset of senior leaders and people on the production floor” create success or failure. There are technical aspects of lean — reducing waste, gaining efficiency. “But lean is really about *change*.” For lean to succeed “you have to think about what your customers need, what your employees are connected with and what your senior leaders support. You won’t be successful unless you do all three.”

Looking back on initial discussions prior to UNC Health Care’s lean initiative, Dirschl says they encountered some resistance. “Nurses and care managers were a bit skeptical. So we had to take three groups of people — doctors, nurses and care managers — and get them all working on this problem.”

There was pushback from all three. “So first we chose some areas in which we could pilot it, where we had champions and knew we’d be successful. We never allowed frustration to build. We made sure that the communications were managed at every step.” Another pushback came from doctors who had to complete a form for every admission. Even though this task took no more than 60 seconds, “it was new work for them,” says Dirschl. “But it was key because it triggered everyone else’s work.” Of particular importance was picking a target discharge date and defining the criteria the patient needed to meet in order to be discharged. “It was a total no-brainer, but this information was never before in a place where people could see it.”

Dirschl acknowledges that lean health care isn’t yet a tsunami, but it is picking up speed. “Doctors are recognizing this is the way of the future, but I’d be exaggerating to say that the midpoint has shifted a whole lot. But it will change a whole lot more in the next five years.”

BCG’s Jon Scholl agrees. “The UNC Health Care lean initiative required new processes and new behaviors — the same things faced by manufacturing plants. Doctors are protective of their time, but they are also scientists, so when they see that something works, they will change.” ●



Lean Financial Services: Cutting Costs While Reducing Risks

The financial services sector has been a laggard in adopting lean tools and practices, perhaps because of their manufacturing origins. But those attitudes are slowly changing. As more banks discover the benefits of lean operations — such as lower costs, fewer errors, faster cycle times and far greater efficiency — wide-scale adoption by the industry is just a matter of time. But old habits often die hard, and slowly.

This article, part of a special report from Knowledge@Wharton and The Boston Consulting Group (BCG) on applying lean concepts to service industries, explores why the industry is dragging its feet, and shows what banks can achieve when they go lean.

Opportunity and Challenges

For process-oriented industries such as financial services, lean holds enormous potential. Lower costs and fewer errors are just the beginning. Banks that take on successful lean programs often see a 15% to 25% improvement in efficiency, BCG experts say. Gains in cycle time can be even more dramatic, with improvements of 30% to 60% possible. Lean thinking can even help management understand which customer groups are most profitable and where service can be enhanced most cost-effectively, says Aryn Merchant, a senior partner in BCG's New York office. The results of lean initiatives can be dramatic:

- An international commercial bank discovered the potential for 30% more efficiency in processing customer transactions — while improving customer satisfaction through more differentiated service.
- A lean audit of one North American asset manager uncovered ways to make product

pricing 12%-20% more efficient by carefully identifying and eliminating non-value added activities.

- Analysts using a lean approach in one investment bank reportedly gained 20%-30% in analyst productivity — and a 60% reduction in cycle time — by redefining credit processes.

Banks that take on successful lean programs often see a 15% to 25% improvement in efficiency.

Given this potential, why hasn't lean made more inroads in the financial services industry? Christian Terwiesch, a professor of operations and information management at Wharton, argues that human nature blocks progress.

Most service companies tend to be in denial that lean applies to their industry, Terwiesch says. Typically, everyone agrees it's great for manufacturing, and then denies it could work in their business. A few years later — perhaps after a competitor has shown some success with a lean approach — some managers concede that lean could work, but only in the back office and other lower-value parts of the operation. Finally, years later, the whole workforce will reorganize. "I can't help but see a pattern here," he says.

In fact, lean for manufacturing and lean for finance are not all that different, says Deepak Goyal, a partner in BCG's New York office. "Finance is just a different kind of factory. It is a processing factory, and there's a lot of waste. The basic philosophy doesn't really change."

Becoming lean involves eliminating the “seven deadly sins” of waste in a process — overproduction, waiting, poor transportation/ logistics, over-processing, sub-optimal inventory control, rework, and unneeded movement. People exposed to lean thinking are trained to see and remove these wasteful practices, he says. As superfluous steps are managed away, the process becomes more efficient. Waste begins to disappear. Speed improves and costs drop.

Another key principle of lean is to focus on what’s important, what matters to the customer, what delivers value, says Christophe Duthoit, a BCG senior partner who manages lean programs for financial services. Almost everything else should be cut. But understanding what customers value isn’t always easy, he notes, especially when functional silos isolate employees from the front line or the marketplace. “Very often, employees get ideas about what’s important to the customer based on limited knowledge or an incomplete understanding of customer needs,” says Duthoit.

Often, lean thinking helps give executives a broader perspective on a process, making it easier to see possibilities for improvements than a more silo-bound view traditionally did.

Changing Mindsets and Attitudes

Lean thinking is nothing new, of course, but BCG consultants say more banks have talked about it than tried it. Far more common is an attempt to cut costs without undertaking an actual lean program. “Lean isn’t simply about cost cutting, but about changing the way you work,” says Duthoit.

While the basic idea of lean is familiar to many financial executives, getting them to follow through is another matter. “It’s like your diet. You know what to eat, I know what to eat, it’s not that hard to know,” Terwiesch says. “But you don’t eat it. You come home, you’re tired from work, and you have a beer. I think the same is true for lean.” Old habits are hard to break.

Many banks that have applied lean to back-office processing have reached a steady state followed by diminishing returns. But there’s a second stage of opportunity in higher-level processes, such as those that touch the customer in branches or the front-office. Still, many executives in those areas continue to deny that lean can improve their productivity. Notes Terwiesch: “They’ll say, ‘Well, lean doesn’t apply to me. It’s just the \$50,000 a year underwriter,

the simple banker in the branch office who should do lean. I am special.’”

Part of the reluctance may have to do with lean’s shop-floor origins. Some executives may equate lean to dumbing down a job. Others mistakenly think lean requires standardizing every part of a process. But it doesn’t, Duthoit says. “It’s more about getting smarter about what you do.”

In fact, getting lean often requires creative thinking. For example, when paperwork moves online, the steps of a financial process are often still performed in a sequential order, even when they could be done in parallel, BCG experts say. So forget the assembly line approach. Think more like a race-car pit crew, and process speed can improve dramatically.

This kind of creative thinking often exposes a great deal of waste. Terwiesch, in his recent operations textbook (*Matching Supply with Demand*, Gerard Cachon, Christian Terwiesch, McGraw-Hill 2008), notes that at one major consumer bank only 40% of the labor that went into loan underwriting added any value. The rest was frittered away on such unproductive activities as processing loans that were unlikely to be accepted by customers because the bank had taken too long to respond, or processing loans that should have been rejected because the applicant’s credit status was obviously too low, and trying — repeatedly but unsuccessfully — to reach customers on the telephone.

Managing Risks

Like any major improvement effort, lean is not risk-free. As systems grow more efficient, warns Eric Clemons, a Wharton professor of operations and information management, quality control and risk management must improve along with them.

In a system with no slack, a single defect in one item can easily snowball into a much larger problem. Just as manufacturers that work on a lean, zero-inventory basis must have assurances from suppliers that their parts will have zero defects, banks with lean operations must put in place strict quality controls, Clemons says. In particular, automatic systems must be watched closely to ensure that they don’t exacerbate a difficult market by, say, withdrawing credit at the wrong time.

But Goyal believes that lean most often reduces risk. “Lean is one of the very effective ways to actually mitigate operational risk, much of which arises from errors at the front line,” he notes. By

standardizing processes and empowering front-line people, managers can cut out a lot of that risk.

Standardization can also reduce errors. For example, in cash reconciliations: “You’re basically taking two entries, trying to compare them, and lowering the bank’s exposure if there’s a mismatch,” Goyal says. In the average big bank, many small groups perform separate reconciliations, “using different technologies, processes and standards.” That can lead to mistakes.

This lack of coordination can be costly, particularly when allowed to continue long-term. “With lean, you can standardize, you can homogenize, you can roll up uniform processes and significantly cut exposure,” says Goyal.

Getting It Right

The best way to begin a lean program is to map an entire end-to-end process, then look for ways to streamline it. “You’re much more likely to be successful carving up and defining specific processes with a beginning point and an endpoint,” says Simon Bartletta, a partner in BCG’s Boston office.

“You need to focus first on some pragmatic, easily implemented and meaningful applications of change,” Duthoit adds. “Once these are shown to be a success, you can build momentum. It’s a marathon.”

But analysis and implementation are extremely different. “In theory, lean tools and techniques are pretty simple,” says Bartletta. “But the execution — getting to success — is complex.” One reason: “It’s a people process, and it requires a big change in the culture and in the way you manage activities.”

Although implementing lean begins as an operations issue, it quickly becomes a change management exercise that requires companies to deal with workers in new, unfamiliar ways. For instance, the lean principle of engaging employees in problem-solving means that workers involved in a process must be asked how it might be simplified or improved. “You can’t just say, ‘Let’s run this exercise and we’ll worry about the people dimension later,’” notes Duthoit. “Managing change and people’s behaviors is a continuous process that must be addressed from day one,” he adds. Managers may see this as slowing down the lean effort, but ultimately it can simplify their task and improve the eventual outcome. “Employees are more likely to resist new approaches if they don’t

understand how they can help improve the process overall or how their effort adds value,” he explains.

While it might be tempting to simply issue an edict and try to order a lean program, Bartletta says that what works best is to engage workers early on. “Lean works best as a balanced top-down and bottom-up effort,” he explains. “The organization needs to share a common goal and set of expectations of value that the lean program will deliver, and have the executive commitment and appropriate governance to enable its success. However, you also want to heavily involve front-line workers and encourage them to share their ideas. You want to let them know that it’s okay for them to speak up, and that they should drive the definition, testing and validation of the new process.”

Done right, lean isn’t a one-off project but instead a pervasive approach to operations that brings lasting cultural change. It transforms the way employees view their work by encouraging them to continually think about ways to improve it, notes Bartletta. “They’re not just there to punch the clock and do what they’re told.” He warns not to overlook this need for change management. “It’s incredibly important to do. Otherwise, lean just becomes a project and a one-time event, and the costs and the risks will creep back in a few years.”

Limits of Lean

Lean does have its limits. One of its core principles and a key part of process optimization is to minimize variability, which reduces errors and improves quality. But going lean would not be a good way to run a fire department, Terwiesch says. “You might say it’s totally inefficient that these guys are getting paid to sit in the station 80% of the time. Wouldn’t it be better to make sure that they’re always busy and that the fire truck is fully utilized? But it just doesn’t work that way, because unless you’re the one causing the fires, a fire department needs to hold excess capacity.”

What’s more, he adds, “an extremely lean system is very vulnerable to external shocks to the system — strikes or traffic jams, bad weather, earthquakes, whatever messes up the system.”

The challenge of using lean in a service business is that the customer is much more closely connected to what’s being produced. In effect, the customer is often the object moving through a service process, and that complicates matters immensely.

“Imagine you’re running a travel office,” says Terwiesch. “The perfect lean team might get its processes right and do everything consistently, but suppose a customer wants to talk for 30 minutes before booking a flight?” The process may not allow for such lengthy conversations. “That’s why, intrinsically, the application of lean is harder in services.”

What’s Next

For many banks, the first item on the lean agenda may be to increase the value and productivity of

a merger or an acquisition. “People are revisiting those partially integrated units, looking for next-generation synergies in operating models and work processes,” says Bartletta.

Lean thinking may also be moving up the value chain in finance, as it has in other service industries. As an example, lean thinking could be applied to investment operations to streamline processes and speed up decision-making, notes Terwiesch. “I see absolutely no reason why lean tools shouldn’t be applied to more knowledge-intensive processes.” ●





Can Lean Co-exist with Innovation?

“Lean” has come to mean an integrated, end-to-end process viewpoint that combines the concepts of waste elimination, just-in-time inventory management, built-in quality, and worker involvement — supported by a cultural focus on problem solving. Can such practical principles be applied to innovation, or would lean’s structure and discipline snuff out the creative spark that underlies the birth and development of great ideas? Can lean co-exist with innovation?

According to experts at The Boston Consulting Group (BCG) and Wharton faculty, lean and innovation can indeed complement each other, and it’s about time they came together. Lean brings structure and predictability to innovation, and sharpens the distinction between idea generation and the development process, they say. Both share a common goal: to meet customer needs in a cost-effective manner. And lean can help empower researchers and reduce uncertainty in the innovation process itself.

“There is intense pressure to cut costs, and companies waste a lot of money on product development because the processes for accelerating the best ideas and terminating low-value ideas are often weak or non-existent,” says Hal Sirkin, senior partner at BCG in Chicago and global head of the firm’s operations practice. Companies would do well, he says, to reorient themselves toward “high-impact, high-value” innovations and to “be aggressive in cutting projects that are unlikely to deliver a payback from their portfolios.”

Redefining the Individual and the Team

Hollywood animation company Pixar, the maker of blockbuster movies including the “Toy Story”

series and “Finding Nemo,” is a good example of how innovation and lean practices can enhance outcomes. Pixar has combined lean and innovation to good effect, according to Kartik Hosanagar, Wharton professor of operations and information management. Working within the movie industry “where lack of predictability is the norm,” Pixar has created a set of processes that emphasizes team-based collaboration and continuous feedback loops to help overcome creative blocks and track deliverables, but without the stress that could go with a regime of control.

Working within the movie industry where lack of predictability is the norm, Pixar has created a set of processes that emphasizes team-based collaboration and continuous feedback loops to help overcome creative blocks and track deliverables.

Pixar’s record is proof that lean and innovation can coexist. “Pixar hasn’t had a single failure as yet. All its projects have been successful,” Hosanagar says, adding that unlike the rest of the movie industry, it has never bought scripts from outside; it develops all its ideas and scripts in-house. “I discovered that much of what the industry uses is madness; what Pixar uses is a method to the madness,” says Hosanagar, who for the last year

has been fascinated by the company while studying it along with Jehoshua Eliashberg, a Wharton professor of marketing, operations and information management.

Part of what helps Pixar succeed is a model of working in which the individual is as valuable to the team as the team is to the individual, says Hosanagar. To help structure fruitful interactions, Pixar has instituted a system of daily meetings where team members talk about what they have or have not accomplished each day and others provide feedback. The point is not to track people. “In a creative world you often hit roadblocks, and team-based collaboration is critical,” he explains. “People might discuss work that is clearly in an incomplete stage; they don’t have to feel embarrassed.” The process involves cross-company teams, too, where one team working on a project might get feedback from another team working on a totally different project.

Filmmaker Woody Allen drafted a similar system years ago, according to Sirkin. “When people in the movie-making business know each other well and make movies over and over together, they get much better at knowing each other’s strengths and weaknesses, and can improvise and collaborate far more effectively,” he says of Allen’s approach.

Separating Idea from Development

Coming up with good ideas is a very different process from developing and commercializing those ideas. Good ideas that don’t generate a payback are ultimately of little value to a company, says Sirkin. Lean can bring the discipline needed to develop and profit from new product and service offerings. “Most people focus on ideas but not necessarily on what it takes to bring those ideas to market, and which ideas will make money,” he says.

What will make money, of course, is an idea such as a new product or an improvement to an existing one that customers are willing to pay for, says Kim Wagner, senior partner and managing director at BCG and co-head of its biopharma R&D practice. Wagner sees lean concepts steadily making inroads into life sciences. “Listen to the voice of the customer,” she says, explaining how “a scientist with an interesting finding” could answer the question of whether it has “any tangible value” for users.

Lean’s focus on the customer can help reality-test an innovation, notes Wagner. It might seem like a

great idea for a pharmaceutical company to replace a daily dosage with a once-a-week pill. But such an approach doesn’t suit the needs of elderly patients. “If you’re 75 years old, it’s hard to remember that it’s a Sunday and you have to take your pill,” she says of a once-weekly dosage regimen, adding that pharmaceutical companies have to factor that market reality into their innovation process.

Listening to the Voice of the Customer

Lean approaches can help organizations take customer satisfaction to new levels. Ravi Aron, a senior fellow at Wharton’s Mack Center for Technological Innovation who does extensive research on healthcare companies worldwide, cites the case of Bumrungrad International Hospital in Bangkok as an example. The hospital goes “well beyond” quality benchmarks in its industry, and owes that to “continuous and constant process improvements” on a range of metrics including recovery rates, time to recovery, length of stay and other patient satisfaction criteria, he says. “It goes beyond medical care to hospitality services, learning from feedback it collects from patients, physicians, clinicians and supporting staff.”

Bumrungrad uses technology in innovative ways to maximize patient satisfaction, including continual electronic updates of patient records. Aron offers an example of how the hospital uses technology in administering medicines, avoiding the “spaghetti process that is prone to errors” and is common across the industry. A Swisslog pharmacy robot aggregates daily dosages for each patient into little rings that go on conveyor belts, get checked by RFID (radio frequency identification) and then by a nurse before they are handed over to patients. “It blew my socks off when I saw it,” he says.

Lean is put to best use in process improvements like those at Bumrungrad, Aron says, and to a relatively lesser degree in product improvements that have longer gestation periods. “Lean is a natural fit for process innovation,” he says. “Lean rarely comes into play in the first stage of product innovation,” and really begins its journey when an organization attempts to “hear the voice of the customer.” The third stage, where it orchestrates product innovation with delivery through constant improvements across its supply chain, “is where lean enters with a vengeance,” as Aron puts it.

Orchestrating Supply Chain Efficiencies

Companies adopting lean concepts learn to integrate their suppliers more actively and earlier in the product development process. “Rather than waiting and testing out your products independently, you might integrate your suppliers — certainly of key components — so that they are already working on delivering it while you are figuring out the details of your innovation,” says Sirkin. Even within the organization, lean has to be an enterprise-wide effort involving the functions of R&D, production, sales and so forth. “You need virtually every part of the company to make an idea come to life,” Sirkin says.

Lean and its sharp customer focus can help companies explore innovation in areas that otherwise may have been overlooked, says Wagner. For example, a pharmaceutical company may decide to continue exploring treatments for hypertension even if half a dozen drug brands dominate that market, she says. Guiding that decision would be certain segments in the patient population that are not adequately served by the drugs currently available, and are willing to pay for alternative treatments that work for them.

Companies that embrace lean methodologies will reduce the risks inherent in their development processes, Wagner says. This is especially critical for pharmaceutical companies, where the drug development process is risky, expensive, and extremely time-consuming. “To shorten this process, many companies front-load activities or do them in parallel,” she explains. “But when development efforts fail — as so many do — these activities end up wasting resources.” Instead, companies should focus their efforts on the activities that increase the technical or commercial probability of a product’s success. “This not only helps the team ‘fail fast’ and move on to the next opportunity, it also limits the amount of extra effort wasted on unsuccessful programs,” she says.

In attempting to reduce waste and speed up processes in the product development process, pharmaceutical companies are also learning to de-layer their organizational structures. Wagner notes that many pharmaceutical companies tend to

have very deep structures, with up to a dozen levels between the head of research and the researcher “at the bench,” adding to costs, delays and other inefficiencies. Managers need to look at all the layers to see what value each adds to the product. “If you cannot articulate what value is added at each level of the organization, then you have to question why that level exists,” She says. The de-layering exercise also “empowers scientists and makes the organization a much more exciting place to work. Productivity goes up.”

Empowering Researchers for Stronger Innovation

At companies that have wedded themselves to inflexibility and regimented processes through Six Sigma programs, lean philosophies can liberate researchers and empower them to redouble their innovation efforts, says Hosanagar. He points to 3M Corp., the maker of innovative products such as Scotchgard, Post-it Notes and Scotch tape, which over the last four years has de-emphasized Six Sigma and the data-driven methodologies it brings to reduce process defects. It’s a word of caution for those taking the notion of variability reduction to its extreme, he says. “Six Sigma clearly has its role in an organization, but excessive adherence to it will kill innovation; people are not going to deviate from the norm and you won’t have innovation.”

Hosanagar goes back to how Pixar marries the structure that lean brings with the freedom creative professionals crave. “They have worked out a golden solution: Nurture creative freedoms and yet reduce waste with the same process,” he says. “They are able to create a situation where projects that are likely to be doomed are eliminated early on.”

Much of what lean represents might seem like a no-brainer, says Sirkin. Yet it is an opportunity for companies that don’t have lean development processes, he says. “Why the focus on lean now? In a downturn, cash-strapped companies are under a lot of pressure to cut costs,” he explains. “The more stress there is on the system, the more people look for ways to relieve that stress, to increase their profitability. It’s all about competition.” ●

Special Report

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